MEMO: Recommendations for Improving TA Scheduling System

TO: Faculty Member, Kelley School of Business
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SUBJECT: Analysis and Recommendations for TA Scheduling System Optimization

Introduction:

Our team has completed an extensive analysis of the current teaching assistant (TA) scheduling system at Kelley School of Business, with the aim to address identified inefficiencies and propose viable solutions. This analysis is based on data gathered from our existing system and insights derived from newly implemented visual analytics in our dashboard.

Key Findings from Data Analysis:

Analysis of Appointment Availability and Utilization:

Tuesday Peak and Project Due Dates:

Through our analysis of the visualization, our team discovered a significant pattern: a notable increase in available appointments on Tuesdays. This could imply intentional overstaffing to anticipate high demand or lower student engagement on that day, which contrasts with project deadlines typically falling on Sundays as it does not align with expected student demand. Theoretical considerations suggest students may prefer seeking help closer to deadlines, indicating a potential need to adjust Teaching Assistant availability.

TA Utilization Disparities:

From analysing Kevin Malone's schedule, we can see a notable surplus of open appointments compared to booked ones, suggesting either a lack of student demand for his availability or a potential mismatch between TA expertise and student requirements. A theoretical consideration proposes investigating a feedback loop system where students can specify preferred TAs and time slots, enabling dynamic scheduling adjustments for better alignment with student needs.

Time Slot Popularity and Scheduling Patterns:

Evening Slots Dominance:

After examining the Time Slot Efficiency graph, we found a significant trend: the highest combined count of open and booked appointments occurs during the late evening hours, particularly between 2:30 PM and 4:00 PM. This suggests that students tend to seek assistance during this time, possibly when they are most alert and engaged. In light of this finding, it's worth exploring whether the distribution of academic workload throughout the day influences these preferences. If there is a correlation, adjusting Teaching Assistant (TA) schedules accordingly could better meet students' needs and optimize efficiency.

Lead Time for Bookings:

Based on our analysis of the visualisation bar plot: "Distribution of Appointment Lead Times" graph, it's evident that there's a wide variation in booking lead times. Some appointments are scheduled more than a week in advance (max lead days is 13 days), which could potentially prevent other students from booking closer to due dates when they need help the most. To address this issue, we propose implementing a rolling booking system which in turn would limit the availability of slots to a certain number of days in advance, ensuring a balance between planning and accessibility.

Bob Slydell exhibits the highest average lead time of 5.33 days, which could indicate less flexibility or higher demand for his hours.

Cancellation Rate and Lead Times:

From the "Cancellation Rate by Time Slot" chart, it's evident that afternoon times have higher cancellation rates, specifically around 2:00 PM and 4:00 PM. This could be due to students initially booking these slots well in advance (as seen from the lead time analysis) and canceling them as their schedules change closer to the date. The lead days in cancellations chart shows a high incidence of bookings made a week in advance, with a significant portion being canceled, suggesting that students might benefit from more flexible, shorter-term booking options.

Appointment Distribution and Inefficiencies:

Inefficient Allocation of TA Resources:

In analysing our appointment status by day bar plot, we observed a concerning trend regarding the allocation of our TA resources. The data revealed that a significant portion of appointments, amounting to 70.64% overall, remained open across all days. This high open rate indicates potential inefficiencies that could be leading to resource wastage and budgetary concerns.

To address this issue, we propose a theoretical consideration: implementing a resource utilization metric. This metric would enable us to track and optimize TA allocation more effectively based on real-time data insights. By leveraging this metric, we could identify and potentially cancel unnecessary time slots, ensuring a more efficient and cost-effective use of our team's resources. This proactive approach aims to enhance our operational efficiency and address the challenges posed by open appointments.

Conclusions and Theoretical Framework for Recommendations:

Adaptive Scheduling: Our findings suggest a need for an adaptive scheduling framework that dynamically matches TA availability with real-time demand. This approach could leverage predictive analytics based on historical data to anticipate peak appointment times and allocate resources accordingly.

Demand-Driven Allocation: Implementing a demand-driven allocation model would ensure that TAs are scheduled during periods of high student demand, especially just before major due dates or exam periods. This proactive strategy aims to maximize TA availability when students need assistance the most.

Feedback Mechanisms: Integrating feedback mechanisms into our scheduling system is crucial. By allowing students to indicate their scheduling preferences and provide feedback on TA support, we can gather valuable insights to continuously refine and improve the scheduling process.

Recommendations Based on Analysis:

Rescheduling Peak TA Availability: Move more TA availability to Thursday, Friday, and Saturday to align better with student work patterns as they approach project due dates on Sunday evenings.

Revise Advance Booking Policies: Limit how far in advance appointments can be booked and implement standby or waiting list features to maximize TA utilization.

Enhanced Scheduling System: Develop an enhanced scheduling platform that incorporates flexible, demand-driven scheduling to adapt to fluctuations in student needs.

Implement a Flexible Walk-In Clinic Model: Transition to a model that incorporates both scheduled appointments and walk-in hours to provide flexibility and reduce the number of unused time slots. Reserve specific high-demand times for walk-in appointments only to ensure efficient use of TA time.

Conclusion:

Leveraging the insights from our data-driven analysis, we believe the recommended strategies will significantly enhance the efficiency and effectiveness of the TA scheduling system. These improvements are aimed at better alignment of TA resources with student needs, thus enhancing academic support and optimizing operational efficiency at Kelley.